

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
17 February 2005 (17.02.2005)

PCT

(10) International Publication Number
WO 2005/015627 A1

(51) International Patent Classification⁷: **H01L 21/304**

(21) International Application Number:
PCT/JP2004/011101

(22) International Filing Date: 28 July 2004 (28.07.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

2003-289442	7 August 2003 (07.08.2003)	JP
2003-289443	7 August 2003 (07.08.2003)	JP
2003-317395	9 September 2003 (09.09.2003)	JP
2004-003654	9 January 2004 (09.01.2004)	JP
2004-114490	8 April 2004 (08.04.2004)	JP

(71) Applicant (for all designated States except US): **EBARA CORPORATION** [JP/JP]; 11-1, Haneda Asahi-cho, Ohta-ku, Tokyo 1448510 (JP).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **YAMADA, Kaoru** [JP/JP]; c/o Ebara Corporation, 11-1, Haneda Asahi-cho, Ohta-ku, Tokyo 1448510 (JP). **SAITO, Takayuki** [JP/JP];

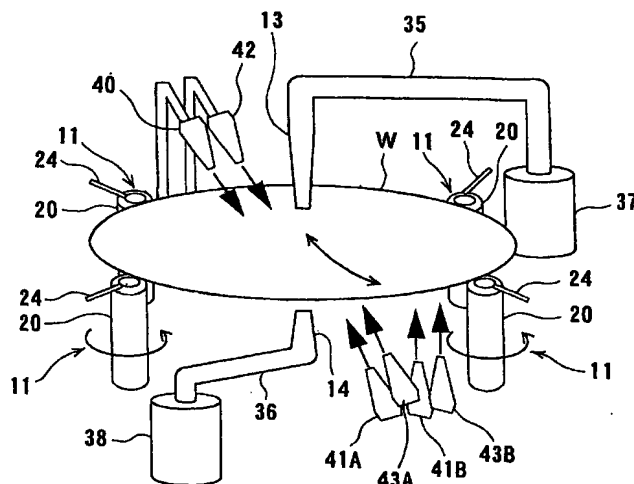
c/o Ebara Research Co., Ltd., 2-1 Honfujisawa 4-chome, Fujisawa-shi, Kanagawa 2518502 (JP). **YABE, Sumio** [JP/JP]; c/o Ebara Corporation, 11-1, Haneda Asahi-cho, Ohta-ku, Tokyo 1448510 (JP). **ITO, Kenya** [JP/JP]; c/o Ebara Corporation, 11-1, Haneda Asahi-cho, Ohta-ku, Tokyo 1448510 (JP). **KAMEZAWA, Masayuki** [JP/JP]; c/o Ebara Corporation, 11-1, Haneda Asahi-cho, Ohta-ku, Tokyo 1448510 (JP). **SEKI, Masaya** [JP/JP]; c/o Ebara Corporation, 11-1, Haneda Asahi-cho, Ohta-ku, Tokyo 1448510 (JP). **KATAKABE, Ichiro** [JP/JP]; c/o Ebara Corporation, 11-1, Haneda Asahi-cho, Ohta-ku, Tokyo 1448510 (JP). **INOUE, Yuki** [JP/JP]; c/o Ebara Corporation, 11-1, Haneda Asahi-cho, Ohta-ku, Tokyo 1448510 (JP).

(74) Agents: **WATANABE, Isamu** et al.; GOWA Nishi-Shinjuku 4F, 5-8, Nishi-Shinjuku 7-chome, Shinjuku-ku, Tokyo 1600023 (JP).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,

[Continued on next page]

(54) Title: SUBSTRATE PROCESSING APPARATUS, SUBSTRATE PROCESSING METHOD, AND SUBSTRATE HOLDING APPARATUS



(57) Abstract: The present invention relates to a substrate processing apparatus and a substrate processing method for performing a chemical liquid process, a cleaning process, a drying process, or the like while rotating a substrate such as a semiconductor wafer or a liquid crystal substrate. The present invention also relates to a substrate holding apparatus for holding and rotating a substrate. The substrate processing apparatus (1) for processing a substrate (W) while supplying a fluid to the substrate (W) includes a substrate holder (11) for holding and rotating the substrate (W), and a holder suction unit (24) for sucking the fluid from the substrate holder (11). The substrate holding apparatus includes a plurality of rollers (20) which are brought into contact with an edge portion of a substrate (W) so as to hold and rotate the substrate (W), and at least one moving mechanism (303a) for moving the rollers (20).



MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.